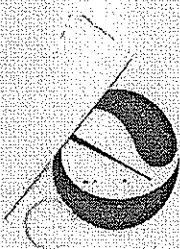


## **APPENDIX A**

---

Hazardous Materials Research Documents

DTSC Approval Letter for Phase II Site Characterization Report



## Department of Toxic Substances Control



Winston H. Hickox  
Agency Secretary  
California Environmental  
Protection Agency

Edwin F. Lowry, Director  
700 Heinz Avenue, Suite 200  
Berkeley, California 94710-2721

Gray Davis  
Governor

November 10, 2003

Mr. Ron Small  
Department of General Services  
Real Estate Service Division,  
Asset Planning and Enhancement Div.  
707 3<sup>rd</sup> Street, Suite 6-130  
West Sacramento, CA 95605

Dear Mr. Small:

The Department of Toxic Substances Control (DTSC) has completed its review of the Site Characterization Report dated October 2003. DTSC, hereby, approves the Report.

If you have any questions, please contact Virginia Lasky of my staff at (510) 540-3829.

Sincerely,

Barbara J. Cook, P.E., Chief  
Northern California – Coastal  
Cleanup Operations Branch

cc: Mr. Jeffrey Crone  
Department of General Services  
Real Estate Service Division,  
Asset Planning and Enhancement Div.  
707 3<sup>rd</sup> Street, Suite 6-130  
West Sacramento, CA 95605

Ms. Anne Wooster Gates, P.E.  
ENVIRON  
5820 Shellmound Street, Suite 700  
Emeryville, California 94608

*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at [www.dtsc.ca.gov](http://www.dtsc.ca.gov).*

DTSC Approval Letter for Revised Screening-Level Risk Assessment



Linda S. Adams  
Secretary for  
Environmental Protection



## Department of Toxic Substances Control

Maureen F. Gorsen, Director  
700 Heinz Avenue  
Berkeley, California 94710-2721



Arnold Schwarzenegger  
Governor

November 7, 2006

Mr. Ron Small  
Department of General Services  
Real Estate Service Division,  
Asset Planning and Enhancement Div.  
707 3<sup>rd</sup> Street, Suite 6-130  
West Sacramento, CA 95605

Dear Mr. Small:

The Department of Toxic Substances Control (DTSC) has completed its review of the Revised Screening-level Risk Assessment dated October 26, 2006 for the Bay Area Research Extension Center (BAREC). DTSC hereby approves the Revised Screening-level Risk Assessment.

If you have any questions, please contact Virginia Lasky of my staff at (510) 540-3829.

Sincerely,

Barbara J. Cook, P.E., Chief  
Northern California  
Coastal Cleanup Operations Branch

cc: Mr. Jeffrey Crone  
Department of General Services  
Real Estate Service Division,  
Asset Planning and Enhancement Div.  
707 3<sup>rd</sup> Street, Suite 6-130  
West Sacramento, CA 95605

cc: Ms. Anne Wooster Gates, P.E.  
ENVIRON  
5820 Shellmound Street, Suite 700  
Emeryville, California 94608

## Screening-Level Risk Assessment for the Former BAREC Property

# **ENVIRON**

## **MEMORANDUM**

Date: October 26, 2006

To: Virginia Lasky

From: Anne Gates, ENVIRON Corporation  
Lynne Haroun, ENVIRON Corporation

Subject: **Screening-level Risk Assessment for the Former University of California Bay Area Research and Extension Center (BAREC)**

---

This memorandum presents a screening-level, human health risk assessment (SRA) for the Former University of California Bay Area Research and Extension Center (BAREC). The site is located at 90 North Winchester Boulevard in the City of Santa Clara, California. As described in the Draft Removal Action Workplan (RAW) (ENVIRON International Corporation [ENVIRON] 2003b), approximately 6,000 cubic yards of soil containing arsenic and dieldrin will be excavated and removed from the site. The purpose of this SRA is to evaluate potential health risks to off-site (nonworker) populations associated with proposed remedial action activities. In particular, the SRA evaluates potential risks to residents living adjacent to the site.

## **BACKGROUND**

Since the 1920s, the BAREC was used as an agricultural research station. The primary research activities focused on improving crop production methods, irrigation systems, nutrition and variety characteristics of crops, and crop disease control. Part of this research involved testing the efficacy of a variety of pesticides applied to soils. The State of California closed the BAREC in early 2003 and plans to sell the property for development of single-family homes, open space, and senior housing. As part of the closure process, a series of environmental investigations were conducted at the site. The investigations included collection of surface soil samples and analysis for pesticide residues at over 60 locations. The chemicals analyzed included 14 chemicals known to have been used at the site, and 75 pesticides that were commonly used prior to 1979. Subsurface soil samples were also collected and analyzed from a former sewer leach pit, a former evaporation pond, and former sediment trap to determine if deeper subsurface soil beneath the site contained pesticide residues. A detailed summary of the soil and other investigations completed at the site is presented in the Site Characterization (ENVIRON 2003a) and Draft RAW Reports (ENVIRON 2003b).

The soil investigation results indicated that arsenic and dieldrin are present in surface soil at concentrations above United States Environmental Protection Agency (USEPA) Region 9

Preliminary Remediation Goals (PRGs). The recommended remediation presented in the Draft RAW is excavation and offsite disposal of soils in areas of the site where these chemicals are present at concentrations above the cleanup goals established in the Draft RAW. The cleanup goal for arsenic is 20 milligrams per kilogram (mg/kg), the natural background concentration for arsenic in the area. The cleanup goal for dieldrin is 0.03 mg/kg, the residential PRG (USEPA 2004)<sup>1</sup>. Approximately 6,000 cubic yards of soil will be excavated and disposed of at an offsite location. Following remediation, the average concentration of arsenic is expected to be approximately 12 mg/kg and the average concentration of dieldrin is expected to be less than 0.03 mg/kg.

## **SCREENING-LEVEL HUMAN HEALTH RISK ASSESSMENT**

A SRA was completed to evaluate the potential health risks associated with potential exposures to airborne dusts released from the site during remedial action activities. The assessment is referred to as a “screening-level” assessment because it is based on simplifying, but health-protective, assumptions that are intended to overestimate the potential risks. The approach used is consistent with risk assessment guidelines from the California Environmental Protection Agency (Cal/EPA) (1994, 2005) and the USEPA (1989).

The available risk assessment guidance and toxicity values from Cal/EPA and USEPA were developed to evaluate long-term (chronic) exposures to chemicals and in some cases, acute (less than one day) exposures. The time to implement the proposed remedial activities at the property is six weeks, which falls between these two general timeframes. For this assessment, the equations and toxicity values used were those developed assuming chronic exposure. This is considered a health-protective approach, in that it allows for the evaluation of potential carcinogenic and noncarcinogenic health effects. Uncertainties associated with the use of methodologies derived for evaluating chronic exposures to evaluate short-term exposures are discussed below with the risk results.

### ***Chemicals of Potential Concern (COPCs)***

The COPCs identified in the Draft RAW are arsenic and dieldrin. Both chemicals are carcinogens and can also induce other, noncarcinogenic effects. All other chemicals analyzed for were below their USEPA residential PRGs and were therefore not identified as COPCs.

### ***Receptors, Exposure Pathways, and Exposure Parameters***

The BAREC is located in a mixed commercial and residential area, with residences adjacent to the site boundary. Consistent with this land use, a child and adult resident receptor are identified for evaluation. Although other off-site receptors could be exposed (e.g.,

---

<sup>1</sup> The California Environmental Protection Agency (Cal/EPA) issued California Human Health Screening Levels (CHHSLs) in 2005 (Cal/EPA 2005). CHHSLs are functionally equivalent to the more familiar U.S. EPA Region 9 PRGs. However, the CHHSLs are derived using toxicity values applicable for California. The residential CHHSL for dieldrin (0.035 mg/kg) is slightly higher than the USEPA Region 9 residential PRG (0.030 mg/kg).



commercial workers or individuals walking by the site), the potential risks of these receptors would be less than those estimated for a resident. The complete exposure pathway evaluated for the resident is inhalation of airborne dusts or particulates released from soil to air. The site is fenced and access is currently restricted such that exposure through direct contact with soil (resulting in possible soil ingestion or dermal contact) would not occur.

The intake (or dose) through the inhalation pathway was estimated using the following equation:

$$I = \frac{C \times IR \times ET \times EF \times ED}{BW \times AT}$$

where:

|    |   |  |
|----|---|--|
| I  | = | Intake of a chemical (mg chemical/kg body weight-day)                            |
| C  | = | Chemical concentration in air (mg chemical/cubic meter [m <sup>3</sup> ]<br>air) |
| IR | = | Inhalation rate (m <sup>3</sup> /hour)   |
| ET | = | Exposure time (hours/day)  |
| EF | = | Exposure frequency (days/week)   |
| ED | = | Exposure duration (weeks)  |
| BW | = | Body weight (kg)   |
| AT | = | Averaging time; period over which exposure is averaged (days)                    |

Consistent with USEPA guidance (1989), the exposure parameter values (or assumptions) used in the intake equation correspond to a reasonable maximum exposure (RME) scenario. Intake assumptions for the RME scenario represent “the highest exposure that is reasonably expected to occur at the site” (USEPA 1989). The intent of the RME scenario is “to estimate a conservative exposure case (i.e., well above the average case) that is still within the range of possible exposures” (USEPA 1989). The RME is estimated by combining “upper-bound and mid-range exposure factors so that the results represent an exposure scenario that is both protective and reasonable; not the worst possible case.”

ENVIRON used default values for the exposure parameters recommended by Cal/EPA and USEPA where available and appropriate. For values specific to the exposure scenario evaluated in this assessment, ENVIRON considered the scope of work, proposed duration of remedial action activities, and typical work hours to identify appropriate values. These exposure parameter values are listed in Table 1 and discussed below.

- **Exposure Time, Exposure Frequency, and Exposure Duration.** The three parameters — exposure time, exposure frequency and exposure duration — together define the total extent of exposure of a receptor. The exposure time, which is the number of hours per day during which the receptor is exposed, is assumed to be 8 hours per day and corresponds to a standard 8-hour workday. This estimate is considered to be conservative because it assumes that dusts would be generated during the entire workday and that the resident would be home during the entire day.

For this assessment, which is of short duration, the exposure frequency is defined as the number of days per week that exposure occurs and the exposure duration is defined as the total number of weeks over which exposure occurs<sup>2</sup>. As reported in the Draft RAW (ENVIRON 2003b), excavation of contaminated soils is expected to take about 2 weeks of the total 6 weeks of remedial action activities. As a conservative assumption, exposure to dusts was assumed to occur the entire 6-week period, with an exposure frequency of 5 days per week, corresponding to a standard workweek.

- **Inhalation Rate.** The inhalation rates for the child and adult were estimated based on assumed activity levels during an 8-hour day and the inhalation rates associated with these activity levels. Information in Table 5-17 USEPA's *Exposure Factors Handbook* (EFH) indicates that activity levels for children and adults in indoor and outdoor environments are "heavy" for approximately 0.2 hr per day; "moderate" for approximately 1.4 hours per day, and "light" for approximately 11 hours per day (USEPA 1997). Corresponding inhalation rates for a child are 1.9, 1.2, and 1.0 m<sup>3</sup>/hr, and those for an adult are 3.2, 1.6, and 1.0 m<sup>3</sup>/hr (from Table 5-23 of the EFH). Assuming that all heavy and moderate activities occur during working hours, with the remaining time at a light activity level, activity-weighted inhalation rates are 1.1 m<sup>3</sup>/hr and 1.2 m<sup>3</sup>/hr for the child and adult, respectively.
- **Body Weight.** A default body weight of 70 kilograms was used for the adult resident and 15 kilograms for the child resident, age 0 to 6 years (Cal/EPA 2005).
- **Averaging Time.** The averaging times for estimating chemical intake depend on the type of effect being assessed. The basis for using different averaging times for carcinogens and noncarcinogens is related to the different mechanisms of action for the two categories of chemicals. In accordance with regulatory guidance (USEPA 1989), intakes for carcinogens are calculated by averaging the dose received over a lifetime (i.e., 70 years or 25,550 days). The 70-year averaging time is used for consistency with the basis of the cancer slope factors. For noncarcinogens, the averaging time is the total number of calendar days over which remedial action activities occur<sup>3</sup>.

### ***Exposure Point Concentration***

The exposure point concentration is the estimated chemical concentration in air to which a receptor is assumed to be exposed. The concentrations of COPCs in air are estimated based

---

<sup>2</sup> Exposure frequency is typically defined as the number of days per year exposure occurs and exposure duration is typically defined as the number of years exposure occurs. However, due to the short duration of remedial activity being evaluated, exposure frequency and exposure duration are defined as days per week and total number of weeks for this evaluation. This is an equivalent calculation, but is expressed in different units because of the short duration of the exposure.

<sup>3</sup> Typically, the averaging time for evaluating the noncarcinogenic endpoint is expressed as the total number years that exposures are assumed to occur. For this assessment, where the total exposure duration is less than 1 year (i.e., 6 weeks), the averaging time is expressed as the total number of weeks. This is an equivalent calculation.

on (1) the concentration of dust in air originating from site soils during excavation activities and (2) the concentration of the COPCs in the soil being excavated.

The dust concentrations used for risk assessment purposes are based on the “respirable” dust fraction (i.e., PM<sub>10</sub>, which is the concentration of particulate matter with an aerodynamic diameter of 10 microns or less). ENVIRON estimated particulate concentrations in air based on information in the Draft RAW indicating that dust levels at the fence line will be managed to meet California Ambient Air Quality Standards (AAQS). The AAQS state that concentrations of PM<sub>10</sub> must not exceed 50 micrograms per cubic meter (µg/m<sup>3</sup>) for a 24-hr period or an annual arithmetic mean of 20 µg/m<sup>3</sup>. The Draft RAW details the dust control measures that will be implemented, as needed, to minimize dust emissions during the removal action and meet the AAQS. These measures include wet suppression (watering), work stoppages during high winds, and wind fences. As described in the Draft RAW, action levels for 8-hour averaging periods were developed using an averaging-time conversion factor of 1.75, taken from USEPA’s *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources* (USEPA 1992). Using this conversion factor, the recommended action level (RAL) is 87.5 µg/m<sup>3</sup>.

To estimate airborne concentrations of COPCs in dust, the RAL of 87.5 µg/m<sup>3</sup> was multiplied by the maximum detected concentrations of arsenic and dieldrin in site soil and an appropriate units conversion factor. Using the maximum detected concentrations of COPCs is a simplifying, but health-protective assumption given that the concentrations of these COPCs in areas to be excavated are not uniform, and much of the soil contains less than the maximum. The exposure point concentrations in air are shown in Table 2.

### ***Toxicity Values***

The toxicity values for evaluating potential health effects are reference doses (RfDs), used to evaluate the noncancer health hazard, and cancer slope factors (CSFs), used to evaluate carcinogenic risk. The toxicity values for arsenic and dieldrin were obtained from Cal/EPA and USEPA sources and are listed in Table 3.

As no inhalation RfD was identified for dieldrin, route-to-route extrapolation from the recommended oral RfD of  $5 \times 10^{-5}$  mg/kg-d was used to evaluate the inhalation route.

The CSFs and RfDs used in this assessment for arsenic and dieldrin were developed to evaluate exposures occurring over a lifetime of 30 or more years. Uncertainties associated with the use of these values to evaluate potential cancer risks and noncancer health effects for an exposure of six weeks or less are discussed below.

### ***Risk Characterization***

Risk characterization, which is the final step of a risk assessment, combines information from the exposure assessment and toxicity assessment to estimate cancer risk and noncancer hazard.

For carcinogenic effects, the cancer risk is estimated using the following equation:

$$\text{Risk} = I \times \text{CSF}$$

where:

Risk = Cancer risk; the incremental probability of an individual developing

cancer as a result of exposure to a cumulative dose of a potential carcinogen (unitless)

I = Intake of a chemical (mg chemical/kg body weight-day)

CSF = Cancer Slope Factor (mg chemical/kg body weight-day)<sup>-1</sup>

The measure of noncarcinogenic effects is the hazard quotient (HQ), which is estimated using the following equation:

$$\text{HQ} = \frac{I}{\text{RfD}}$$

where:

HQ = Hazard quotient; an expression of the potential for noncarcinogenic

effects (unitless)

I = Intake of a chemical (mg chemical/kg body weight-day)

RfD = Reference Dose; the toxicity value indicating the threshold amount of

chemical contacted below which no adverse health effects are expected (mg chemical/kg body weight-day).

The estimated cancer risks and HQs for arsenic and dieldrin are shown in Table 4 and the risk results are discussed in the following section.

### ***Summary and Discussion***

The objective of this SRA was to evaluate the cancer risk and noncancer health hazard associated with potential exposures of a residential receptor to airborne dusts released during remedial action activities. Potential airborne dust concentrations were estimated based on information on allowable dust levels presented in the Draft RAW. The exposure pathway evaluated was inhalation of airborne particulates. No other complete exposure pathway was identified because the site is fenced and access restricted, precluding direct contact with soil.

To help place the results of the SRA in perspective, the risk results can be compared to target risk ranges or benchmarks established by the USEPA in the National Contingency Plan and the California Environmental Protection Agency (Cal/EPA). The USEPA "target risk range" includes excess cancer risks from one in one million ( $1 \times 10^{-6}$ ) to one hundred in one million ( $100 \times 10^{-6}$ ). As a risk management policy, the Cal/EPA generally requires that cancer risks be closer to the one in one million ( $1 \times 10^{-6}$ ) end of the target risk range. A "hazard index" is used to evaluate noncancer health effects; a hazard index of one (1) or less is not expected to result in adverse noncancer health effects.

As shown in Table 4, the total cancer risk for exposure to arsenic and dieldrin combined was six in one billion ( $6 \times 10^{-9}$ ) for an adult resident and three in 100 million ( $3 \times 10^{-8}$ ) for a child resident. These levels are approximately 30 to 200 times below the lower end of the target risk range. The noncancer hazard indices are 0.04 for an adult and 0.2 for a child, well below 1 (one), the level of concern.

A number of uncertainties are inherent in the estimates of potential cancer risk and noncancer hazard that are derived in risk assessments. The uncertainties result in part from the estimates of what the actual exposure will be and from incomplete information about the toxicity of chemicals in humans. In general, risk assessment guidelines require use of assumptions and toxicity values that will tend to overestimate risks. The SRA is based, by necessity, on a number of assumptions regarding the actual time and number of days a person could be exposed to airborne dusts from the Site. In general, the values for the exposure parameters were selected to overestimate possible exposures and associated risk. For example, ENVIRON assumed that residents would be exposed to dust 8 hours per day, 5 days per week, for 6 weeks. These assumptions are considered to be health protective because excavation of contaminated areas is expected to take approximately 2 weeks, with building demolition and other activities occurring during the remaining 4 weeks that would not involve working in contaminated areas. The risks would be 3-fold less for a 2-week excavation period as compared to the 6-week period conservatively assumed in this assessment. Further, residents typically are away from home during some portion of the day, further reducing possible exposure and risk. In addition, ENVIRON assumed that exposure would be to the maximum detected concentrations of arsenic and dieldrin. Again, this is a health-protective assumption in that the concentrations of these chemicals in areas to be excavated are not uniform such that the average concentration in airborne dusts over the exposure period would be less than the concentration used in this assessment.

For this assessment, an additional uncertainty not typically found in most risk assessments is the use of assumptions and equations that have been developed to estimate risks associated with long-term (or chronic) exposures to estimate the risks from potential exposures at this site that will occur over a relatively short time period of six weeks. Because different methods are used to evaluate the risk for cancer and noncancer health endpoints, these uncertainties are discussed separately for the two different endpoints.

- **Cancer endpoint.** Cal/EPA considers arsenic and dieldrin, the two COPCs evaluated in this assessment, to be carcinogens. ENVIRON developed cancer risk estimates for these chemicals based on an exposure duration of six weeks. The equations and toxicity values used in this assessment to characterize cancer risk are based on studies and assumptions that exposure occurs continuously over a lifetime of 70 years. The regulatory agencies have not developed a separate methodology for evaluating cancer risk for a short-term exposure. While acknowledging that additional uncertainty is associated with the risk estimates, it is common practice to apply the equations developed assuming chronic exposure to exposures of shorter duration. The modeling exercises described below suggest that using methodologies derived for

long-term exposures to derive cancer risk estimates for short-term exposures may over- or underestimate the cancer risk by a factor of ten or less.

Investigators have conducted modeling exercises to evaluate the potential uncertainty in the assumption that time-dependent exposure patterns can be characterized by a constant dose, such as the simple time-weighted lifetime average daily dose (LADD) used in this assessment (Goddard et al. 1995; Murdoch and Krewski 1988). The impact of using a time-weighted average dose when estimating cancer risk is dependent on the stage in carcinogenic process that the chemical affects, which for most chemicals is unknown. In general, when using a model such as the Multistage model, the actual low-dose risk induced by time-dependent dosing patterns may exceed that predicted by a time-weighted average. However, with the Multistage model, this difference for low doses is likely to be no more than a factor of 2 (Murdoch and Krewski 1988). More focused evaluations considering specific chemicals, such as temporal exposure to pesticide residues in diets of infants and children have indicated a limited degree of underestimation (approximately a factor of 5 or less) when using a LADD, as compared to a time-dependent dose (Goddard et al. 1995). In addition, there was also a suggestion of overestimation of risk of up to a factor of 4, depending on the dose-dependent stage in the cancer process.

In general, these modeling exercises suggest that there is some uncertainty in the use of a LADD to estimate potential risk from exposure to carcinogenic chemicals. Depending on the mechanism of action of the chemical and sensitive stage in the carcinogenic process, use of a LADD could under- or overestimate cancer risk. Based on comparisons of the use of temporal versus time-weighted averages with the Multistage model (Goddard et al. 1995; Murdoch and Krewski 1988), the potential for over- or underestimation of risk appears to be less than one order of magnitude (i.e., a factor of 10). For this assessment, in which the estimated cancer risk for the most sensitive receptor (the child) was  $1 \times 10^{-8}$ , the potential cancer risk would remain below agency-established target risk levels even if underestimated by a factor of 10.

- **Noncancer endpoint.** In addition to being carcinogens, arsenic and dieldrin also have the potential to cause other types of adverse health effects. As discussed previously, the potential for the occurrence of noncancer effects is evaluated by comparing the estimated average daily intake to an RfD, where an RfD is the level of exposure that is not expected to cause any adverse health effects. For arsenic and dieldrin, the available RfDs are applicable to chronic (long-term) exposures that are protective for exposures occurring over a lifetime of 30 years or more. RfDs derived for shorter timeframes were not available for these chemicals. In all cases, using a chronic RfD to evaluate a short-term exposure yields a higher hazard index than would be derived if an RfD for a short-term exposure were used, and for most chemicals, the chronic RfD significantly overestimates the hazard index. That is, the hazard indices for arsenic and dieldrin estimated in this assessment using a chronic RfD are higher than those that would be estimated using RfDs derived for short-term exposures.

## CONCLUSIONS

The results of this SRA indicate that potential risks to nearby residents associated with the proposed removal action at the property are well below risk levels of concern established by USEPA and Cal/EPA. The estimated cancer risks are well below the lower end of the acceptable risk range and the noncancer health hazards are below levels at which adverse health effects would be expected.

## REFERENCES

- California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC). 1994. *Preliminary Endangerment Assessment (PEA) Guidance Manual*. January.
- Cal/EPA. 2005. *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*. January.
- ENVIRON International Corporation. 2003a. *Phase II-Site Characterization Report, University of California Former Bay Area Research and Extension Center (BAREC)*. October.
- ENVIRON International Corporation. 2003b. *Draft Removal Action Workplan (RAW), Former University of California Bay Area Research and Extension Center (BAREC)*. December.
- Goddard, M.J., Murdoch, D.J. and Krewski, D. 1995. Temporal aspects of risk characterization. *Inhal. Toxicol.* 7:1005-1018.
- Murdoch, D.J. and Krewski, D. 1988. Carcinogenic risk assessment with time-dependent exposure patterns. *Risk Anal.* 8: 521-530.
- U.S. Environmental Protection Agency (USEPA). 1989. *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A), Interim Final*, EPA/540/1-89/002. December.
- USEPA. 1992. *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised*. EPA-454/R-92-019. October.
- USEPA. 1997. *Exposure Factors Handbook. Volume I – General Factors*. EPA/600/P-95/002Fa. Washington, D.C. August.
- USEPA. 2004. *Region 9 Preliminary Remediation Goals (PRGs) 2004*. San Francisco, CA. October.

**Table 1**  
**Exposure Parameters**  
**Former University of California Bay Area Research and Extension Center**  
**Santa Clara, California**

| Parameter                   | Symbol | Units              | Child Resident | Adult Resident | Reference |
|-----------------------------|--------|--------------------|----------------|----------------|-----------|
| <b>Inhalation Pathway</b>   |        |                    |                |                |           |
| Inhalation Rate             | IR     | m <sup>3</sup> /hr | 1.1            | 1.2            | See text  |
| Exposure Time               | ET     | hrs/day            | 8              | 8              | See text  |
| Exposure Frequency          | EF     | day/wk             | 5              | 5              | See text  |
| Exposure Duration           | ED     | week               | 6              | 6              | See text  |
| Body Weight                 | BW     | kg                 | 15             | 70             | DTSC 1994 |
| Averaging Time (cancer)     | AT     | days               | 25,550         | 25,550         | DTSC 1994 |
| Averaging Time (non-cancer) | AT     | days               | 42             | 42             | See text  |

Source:

Department of Toxic Substances Control (DTSC). 1994. *Preliminary Endangerment Assessment Guidance Manual*. California Environmental Protection Agency. January.



**Table 2: Calculation of Exposure Point Concentrations in Air**  
**Former University of California Bay Area Research and Extension Center**  
**Santa Clara, CA**

| Chemical of Potential Concern | EPC for Chronic Assessment                                |  |                                 |  |
|-------------------------------|---|--|---------------------------------|--|
|                               | Soil Conc <sup>a</sup><br>(C <sub>soil</sub> )<br>(mg/kg) | PM <sub>10</sub><br>Air Conc<br>(mg/m <sup>3</sup> ) | Conversion<br>Factor<br>(kg/mg) | EPC in Air<br>(C <sub>air</sub> ) <sup>b</sup><br>(mg/m <sup>3</sup> ) |
| Arsenic                       | 37  | 0.0875   | 1.E-06                          | 3.2E-06  |
| Dieldrin                      | 0.24  | 0.0875   | 1.E-06                          | 2.1E-08  |

Notes:

<sup>a</sup> The soil concentration is the maximum detected concentration at the site.

<sup>b</sup> Concentration in air calculated using the following equation:

$$C_{air} = \text{Soil Concentration} \times PM_{10} \text{ Air Concentration} \times \text{Conversion Factor}$$

**Table 3**  
**Cancer and Noncancer Toxicity Values**  
**Former University of California Bay Area Research and Extension Center**  
**Santa Clara, California**

| Chemical of Potential Concern | Cancer Slope Factor (CSF)<br>(1/mg/kg-d) |               | Chronic Noncancer Reference Dose (RfD)<br>(mg/kg-d) |               |
|-------------------------------|--|---------------|---|---------------|
|                               | Inhalation                               | Source        | Inhalation  | Source        |
| Arsenic                       | 1.2E+01                                  | Cal/EPA 2005a | 8.6E-06   | Cal/EPA 2005b |
| Dieldrin                      | 1.6E+01                                  | Cal/EPA 2005a | 5.0E-05   | IRIS          |

Notes

IRIS            Integrated Risk Information System (USEPA 2006)  
mg/kg-d       milligram per kilogram per day  
NA             not available

Sources:

Cal/EPA. 2005a. Cancer Potency Factors (CPFs). <http://www.oehha.ca.gov/risk/pdf/cancerpotalpha81005.pdf>.  
Accessed: May 17, 2006.

Cal/EPA. 2005b. Reference Exposure Levels. [http://www.oehha.ca.gov/air/chronic\\_rels/index.html](http://www.oehha.ca.gov/air/chronic_rels/index.html).  
Accessed: May 17, 2006.

USEPA. 2006. Integrated Risk Information System (IRIS). <http://www.epa.gov/iris/index.html>. Accessed: May 17, 2006

**Table 4**  
**Calculation of Hazards and Cancer Risks for a Resident**  
**Former University of California Bay Area Research and Extension Center**  
**Santa Clara, California**

**Adult**

| Chemical of Potential Concern | Cair (mg/m <sup>3</sup> ) | IR (m <sup>3</sup> /hr) | ET (hr/d) | EF (d/wk) | ED (wk) | BW (kg) | ATnc (d) | ATc (d) | Intake_nc (mg/kg-d) | Intake_c (mg/kg-d) | RfD (mg/kg-d) | CSFi (1/mg/kg-d) | HQ           | Risk           |
|-------------------------------|---------------------------|-------------------------|-----------|-----------|---------|---------|----------|---------|---------------------|--------------------|---------------|------------------|--------------|----------------|
| Arsenic                       | 3.2E-06                   | 1.2                     | 8         | 5         | 6       | 70      | 42       | 25,550  | 3.2E-07             | 5.2E-10            | 8.6E-06       | 1.2E+01          | 0.037        | 6.3E-09        |
| Dieldrin                      | 2.1E-08                   | 1.2                     | 8         | 5         | 6       | 70      | 42       | 25,550  | 2.1E-09             | 3.4E-12            | 5.0E-05       | 1.6E+01          | 0.000041     | 5.4E-11        |
| <b>TOTAL RISK</b>             |                           |                         |           |           |         |         |          |         |                     |                    |               | <b>TOTAL</b>     | <b>0.037</b> | <b>6.3E-09</b> |

**Child**

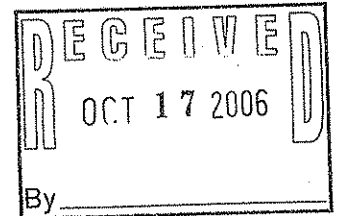
| Chemical of Potential Concern | Cair (mg/m <sup>3</sup> ) | IR (m <sup>3</sup> /hr) | ET (hr/d) | EF (d/wk) | ED (wk) | BW (kg) | ATnc (d) | ATc (d) | Intake_nc (mg/kg-d) | Intake_c (mg/kg-d) | RfD (mg/kg-d) | CSFi (1/mg/kg-d) | HQ           | Risk           |
|-------------------------------|---------------------------|-------------------------|-----------|-----------|---------|---------|----------|---------|---------------------|--------------------|---------------|------------------|--------------|----------------|
| Arsenic                       | 3.2E-06                   | 1.1                     | 8         | 5         | 6       | 15      | 42       | 25,550  | 1.4E-06             | 2.2E-09            | 8.6E-06       | 1.2E+01          | 0.158        | 2.7E-08        |
| Dieldrin                      | 2.1E-08                   | 1.1                     | 8         | 5         | 6       | 15      | 42       | 25,550  | 8.8E-09             | 1.4E-11            | 5.0E-05       | 1.6E+01          | 0.00018      | 2.3E-10        |
| <b>TOTAL RISK</b>             |                           |                         |           |           |         |         |          |         |                     |                    |               | <b>TOTAL</b>     | <b>0.158</b> | <b>2.7E-08</b> |

| Receptor        | HI   | TOTAL RISK |
|-----------------|------|------------|
| Total for Adult | 0.04 | 6E-09      |
| Total for Child | 0.2  | 3E-08      |

## Voluntary Cleanup Agreement

STATE OF CALIFORNIA  
ENVIRONMENTAL PROTECTION AGENCY  
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

|                               |   |                                   |
|-------------------------------|---|-----------------------------------|
| In the Matter of:             | ) | Docket No. <u>HSA-A 02/03-176</u> |
|                               | ) |                                   |
| University of California      | ) |                                   |
| Bay Area Research and         | ) | Voluntary Cleanup                 |
| Extension Center (BAREC)      | ) | Agreement                         |
| 90 North Winchester Blvd.     | ) |                                   |
| Santa Clara, California       | ) |                                   |
|                               | ) |                                   |
| Project Proponent:            | ) | Health and Safety Code            |
|                               | ) |                                   |
| California Department         | ) | Section 25355.5(a)(1)(C)          |
| Of General Services           | ) |                                   |
| 707 Third Street, Suite 6-130 | ) |                                   |
| Sacramento, CA 95605          | ) |                                   |
|                               | ) |                                   |
|                               | ) |                                   |



I. INTRODUCTION

1.1 Parties. The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) enters into this Voluntary Cleanup Agreement (Agreement) with the California Department of General Services (Proponent).

1.2 Site. The property that is the subject of this Agreement (Site) is located in Santa Clara, California. The Site property consists of approximately 17 acres and is identified by Santa Clara County Assessor's Parcel Numbers (APN) 303-17-048 and 303-17-049. A diagram of the Site and a location map are attached as Exhibit A and Exhibit B.

1.3 Jurisdiction. This Agreement is entered into by DTSC and Proponent pursuant to Health and Safety Code (H&SC) section 25355.5(a)(1)(C). This section authorizes DTSC to enter into an enforceable agreement with Proponents to oversee the characterization and cleanup of a Site.

1.4 Purpose. The purpose of this Agreement is for the Proponent to complete a Remedial Action under the oversight of DTSC. The goal of the Proponent is to investigate and clean up the Site so that it is suitable for unrestricted residential development.

## II. BACKGROUND

2.1 Ownership. The Site is owned by the State of California.

2.2 Substances Found at the Site. Reports containing the results of environmental media sampling conducted at the Site indicate that various portions of the property are or may be contaminated with hazardous substances, including the following pesticides: arsenic, dieldrin, endrin, heptachlor epoxide, 4,4'- DDT and 4,4'- DDE.

2.3 Physical Description. The Site is agricultural land. The topography of the entire area is relatively flat. The site is surrounded on three sides by single-family residential housing and by North Winchester Boulevard on the east.

2.4 Site History. The site has been used for testing agricultural chemicals on fruit trees and other row crops since 1928.

## III. AGREEMENT

3.0 IT IS HEREBY AGREED THAT DTSC will provide review and oversight of the response activities conducted by the Proponent in accordance with the Scope of Work contained in Exhibit C. The Proponent shall conduct the activities in the manner specified herein and in accordance with the schedule specified in Exhibit E. All work shall be performed consistent with H&SC section 25300 et seq., as amended; the National Contingency Plan (40 Code of Federal Regulations (CFR) Part 300), as amended; and U.S. EPA and DTSC Superfund guidance documents regarding site investigation and remediation.

3.1 Scope of Work and DTSC Oversight. DTSC shall review and provide Proponent with written comments on all Proponent deliverables as described in Exhibit C (Scope of Work) and other documents applicable to the scope of the project. DTSC shall provide oversight of field activities, including sampling and remedial activities, as appropriate. Upon submission of satisfactory reports by Proponent, DTSC shall approve the risk assessment, community relations plan, and final Removal Action Workplan (RAW) for the Site and shall provide certification of closure upon completion of the project, or if implementation is phased, completion of each phase of the project. DTSC's completion of activities described above shall constitute DTSC's complete performance under this Agreement.

3.2 Additional Activities. Additional activities may be conducted and DTSC oversight provided by amendment to this Agreement or Exhibits hereto in accordance with Paragraph 3.17. If DTSC expects additional oversight costs to be incurred related to these additional activities, it will provide an estimate of the additional oversight cost to the Proponent.

3.3 Agreement Managers. Barbara J. Cook is designated by DTSC as its Manager for this Agreement. J. Frank Davidson of the Department of Genral Services, Real Estate Services Division is assigned by the Proponent as Manager for this Agreement. Each Party to this Agreement shall provide at least ten (10) days advance written notice to the other of any change in its designated manager.

3.4 Notices and Submittals. All notices, documents and communications required to be given under this Agreement, unless otherwise specified herein, shall be sent to the respective parties at the following addresses in a manner that produces a record of the sending of the notice, document or communication such as certified mail, overnight delivery service, facsimile transmission or courier hand delivery service:

3.4.1 To DTSC:

Barbara Cook, Regional Branch Chief  
Attn: Virginia Lasky  
Department of Toxic Substances Control  
Site Mitigation Program  
700 Heinz Avenue, Suite 200  
Berkeley, CA 94710-2737

3.4.2 To the Proponent:

J. Frank Davidson  
State of California  
Department of General Services  
Real Estate Services Division  
Asset Planning and Enhancement Branch  
707 Third Street, Suite 6-130  
West Sacramento, CA 95605

3.5 DTSC Review and Approval. If DTSC determines that any report, plan, schedule or other document submitted for approval pursuant to this Agreement fails to comply with this Agreement or fails to protect public health or safety or the environment, DTSC may (a) Return written comments to the Proponent with recommended changes; or (b) Provide written comments and conditionally approve the document as long as Proponent makes requested changes.

3.6 Communications. All DTSC approvals and decisions made regarding submittals and notifications will be communicated to the Proponent in writing by DTSC's Agreement Manager or his/her designee. No informal advice, guidance, or suggestions or comments by DTSC regarding reports, plans, specifications, schedules or any other writings by the Proponent shall be construed to relieve the Proponent of the obligation to obtain such written approvals.

3.7 Endangerment During Implementation. In the event DTSC determines that any activity (whether or not pursued in compliance with this Agreement) may pose an imminent or substantial endangerment to the health and safety of people on the Site or in the surrounding area or to the environment, DTSC may order the Proponent to stop further implementation of this Agreement for such period of time as may be needed to abate the endangerment.

3.8 Payment. The Proponent agrees to pay (1) all costs incurred by DTSC in association with preparation of this Agreement and for review of documents submitted prior to the effective date of the Agreement, and (2) all costs incurred by DTSC in providing oversight pursuant to this Agreement, including review of the documents described in Exhibit C and associated documents, and in providing oversight of field activities. An estimate of DTSC's oversight costs is attached as Exhibit D. It is understood by the parties that Exhibit D is an estimate and cannot be relied upon as the final cost figure. DTSC shall notify the Proponent in advance if its costs will exceed the estimate provided in Exhibit D and DTSC and the Proponent shall agree on a supplement to that estimate before further DTSC costs are incurred. DTSC will bill the Proponent quarterly. Proponent agrees to make payment within sixty (60) days of receipt of DTSC's billing. Such billings will reflect any amounts that have been advanced to DTSC by the Proponent.

3.8.1 In anticipation of services to be rendered, Proponent shall make an advance payment of **\$24,000** to DTSC. That payment shall be made no later than ten (10) days after this Agreement is fully executed. If the Proponent's advance payment does not cover all costs payable to DTSC under this paragraph, Proponent agrees to pay the additional costs within sixty (60) days of receipt of a bill from DTSC.

3.8.2 If any bill is not paid by the Proponent within sixty (60) days after it is sent by DTSC, the Proponent may be deemed to be in material default of this Agreement.

3.8.3 All payments made by the Proponent pursuant to this Agreement shall be by check made payable to the "Department of Toxic Substances Control", and bearing on its face the project code for the Site (**Calstars #201464-11**) and the docket number of this Agreement. Payments shall be sent to:

Department of Toxic Substances Control  
Accounting/Cashier  
1001 I Street, 21st Floor  
P.O. Box 806  
Sacramento, California 95812-0806

A photocopy of the check shall be sent concurrently to DTSC's Agreement Manager/Regional Branch Chief.



3.8.4 If the advance payment exceeds DTSC's actual oversight costs, DTSC will provide an accounting for expenses and refund the difference within one hundred-twenty (120) days after termination of this Agreement in accordance with Paragraph 3.18. In no other case shall the Proponent be entitled to a refund from DTSC or to assert a claim against DTSC for any amount paid or expended under this Agreement.

3.9 Condition Precedent. It is expressly understood and agreed that DTSC's receipt of the advance payment described in Paragraph 3.8.1. is a condition precedent to DTSC's obligation to provide oversight, review and/or comment on documents.

3.10 Record Retention. DTSC shall retain all cost records associated with the work performed under this Agreement for such time periods as may be required by applicable state law. The Proponent may request to inspect all documents which support DTSC's cost determination in accordance with the Public Records Act, Government Code section 6250 et seq.

3.11 Project Coordinator. The work performed pursuant to this Agreement shall be under the direction and supervision of a qualified project coordinator, with expertise in hazardous substance site cleanup. The Proponent shall submit: a) the name and address of the project coordinator; and b) in order to demonstrate expertise in hazardous substance site cleanup, the résumé of the coordinator. The Proponent shall promptly notify DTSC of any change in the identity of the Project Coordinator. All engineering and geological work shall be conducted in conformance with applicable state law, including but not limited to Business and Professions Code sections 6735 and 7835.

3.12 Access. Proponent shall provide, and/or obtain access to the Site and offsite areas to which access is necessary to implement this Agreement. Such access shall be provided to DTSC's employees, contractors, and consultants at all reasonable times. Nothing in this paragraph is intended or shall be construed to limit in any way the right of entry or inspection that DTSC or any other agency may otherwise have by operation of any law. DTSC and its authorized representatives shall have the authority to enter and move freely about all property at the Site at all reasonable times for purposes including, but not limited to: inspecting records and operating logs, sampling and analytic data, and contracts relating to this Site; reviewing the progress of the Proponent in carrying out the terms of this Agreement; conducting such tests as DTSC may deem necessary; and verifying the data submitted to DTSC by the Proponent.

3.13 Sampling, Data and Document Availability. When requested by DTSC, the Proponent shall make available to DTSC, and shall provide copies of, all data and information concerning contamination at the Site, including technical records and contractual documents, sampling and monitoring information and photographs and maps, whether or not such data and information was developed pursuant to this Agreement.

3.14 Notification of Field Activities. The Proponent shall inform DTSC at least seven (7) days in advance of all field activities pursuant to this Agreement and shall allow DTSC and its authorized representatives to take duplicates of any samples collected by the Proponent pursuant to this Agreement.

3.15 Notification of Environmental Condition. The Proponent shall notify DTSC's Agreement Manager immediately upon learning of any condition posing an immediate threat to public health or safety or the environment. Within seven (7) days of the onset of such a condition, the Proponent shall furnish a report to DTSC, signed by the Proponent's Agreement Manager, setting forth the events which occurred and the measures taken in the response thereto.

3.16 Preservation of Documentation. The Proponent shall maintain a central repository of the data, final reports, and other documents prepared pursuant to this Agreement. All such data, reports and other documents shall be preserved by the Proponent for a minimum of six (6) years after the conclusion of all activities carried out under this Agreement. If DTSC requests that some or all of these documents be preserved for a longer period of time, the Proponent shall either comply with that request, deliver the documents to DTSC, or permit DTSC to copy the documents prior to destruction. The Proponent shall notify DTSC in writing at least ninety (90) days prior to the expiration of the six-year minimum retention period before destroying any documents prepared pursuant to this Agreement. If any litigation, claim, negotiation, audit or other action involving the records has been started before the expiration of the six year period, the related records shall be retained until the completion and resolution of all issues arising therefrom or until the end of the six-year period, which ever is later.

3.17 Amendments. This Agreement may be amended or modified solely upon written consent of all parties. Such amendments or modifications may be proposed by any party and shall be effective the third business day following the day the last party signing the amendment or modification sends its notification of signing to the other party. The parties may agree to a different effective date.

3.18 Termination for Convenience. Except as otherwise provided in this Paragraph, each party to this Agreement reserves the right unilaterally to terminate this Agreement for any reason. Termination may be accomplished by giving a thirty (30) day advance written notice of the election to terminate this Agreement to the other Party. In the event that this Agreement is terminated under this Paragraph, the Proponent shall be responsible for DTSC costs through the effective date of termination and DTSC shall be responsible for reimbursing any advance money paid by Proponent but not yet spent on oversight activities.

3.19 Exhibits. All exhibits attached to this Agreement are incorporated herein by this reference.

3.20 Time Periods. Unless otherwise specified, time periods begin from the date this Agreement is fully executed, and "days" means calendar days. "Business days" means all calendar days that are not weekends or Official State holidays.

3.21 Proponent Liabilities. Nothing in this Agreement shall constitute or be considered a satisfaction or release from liability for any condition or claim arising as a result of Proponent's past, current, or future operations. Nothing in this Agreement is intended or shall be construed to limit the rights of any of the parties with respect to claims arising out of or relating to the deposit or disposal at any other location of substances removed from the Site.

3.22 Government Liabilities. DTSC shall not be liable for any injuries or damages to persons or property caused during performance of investigative or remedial activities pursuant to this Agreement, either resulting from acts or omissions by the Proponent or by related parties in carrying out activities pursuant to this Agreement, nor shall the DTSC be held as a party to any contract entered into by the Proponent or its agents in carrying out the activities pursuant to this Agreement.

3.23 Third Party Actions. In the event that the Proponent is a party to any suit or claim for damages or contribution relating to the Site to which DTSC is not a party, the Proponent shall notify DTSC in writing within ten (10) days after service of the complaint in the third-party action. Proponent shall pay all costs incurred by DTSC relating to such third-party actions, including but not limited to responding to subpoenas.

3.24 Reservation of Rights. DTSC and the Proponent reserve the following rights.

3.24.1 DTSC and Proponent reserve their rights to pursue cost recovery under the Comprehensive Environmental Response, Compensation and Liability act of 1980 (CERCLA), as amended, the California Health and Safety Code section 25360, and any other applicable section of the law.

3.24.2 Nothing in this Agreement is intended or shall be construed to limit or preclude DTSC from taking any action authorized by law or equity to protect public health and safety or the environment and recovering the costs thereof.

3.24.3 By entering into this Agreement, Proponent does not admit to any fact, fault or liability under any statute or regulation.

3.25 Compliance with Applicable Laws. Nothing in this Agreement shall relieve the Proponent from complying with all applicable laws and regulations, and the Proponent shall conform all actions required by this Agreement with all applicable federal, state and local laws and regulations.

3.26 California Law. This Agreement shall be governed, performed and interpreted under the laws of the State of California.

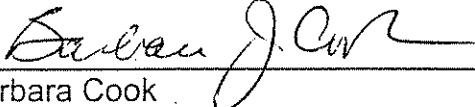
3.27 Severability. If any portion of this Agreement is ultimately determined not to be enforceable, that portion will be severed from the Agreement and the severability shall not affect the enforceability of the remaining terms of the Agreement.

3.28 Parties Bound. This Agreement applies to and is binding, jointly and severally, upon each signatory and its officers, directors, agents, receivers, trustees, heirs, executors, administrators, successors, and assigns, and upon any successor agency to DTSC that may have responsibility for and jurisdiction over the subject matter of this Agreement. No change in the ownership or corporate or business status of any signatory, or of the facility or Site shall alter any signatory's responsibilities under this Agreement.

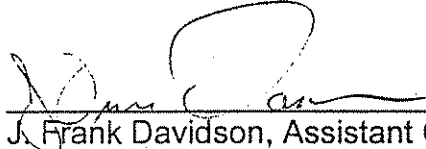
3.29 Effective Date. The effective date of this Agreement is the date when this Agreement is fully executed.

3.30 Representative Authority. Each undersigned representative of the parties to this Agreement certifies that she or he is fully authorized to enter into the terms and conditions of this Agreement and to execute and legally bind the parties to this Agreement.

3.31 Counterparts. This Agreement may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document.

  
\_\_\_\_\_  
Barbara Cook  
Northern California - Coastal Cleanup Operations Branch  
Statewide Cleanup Operations Division  
Site Mitigation Program  
Department of Toxic Substances Control

Date: 5/12/2003

  
\_\_\_\_\_  
J. Frank Davidson, Assistant Chief  
Asset Planning and Enhancement Branch  
Real Estate Services Division  
State of California  
Department of General Services

Date: May 8, 2003

## EXHIBITS

A - SITE DIAGRAM

B - SITE LOCATION MAP

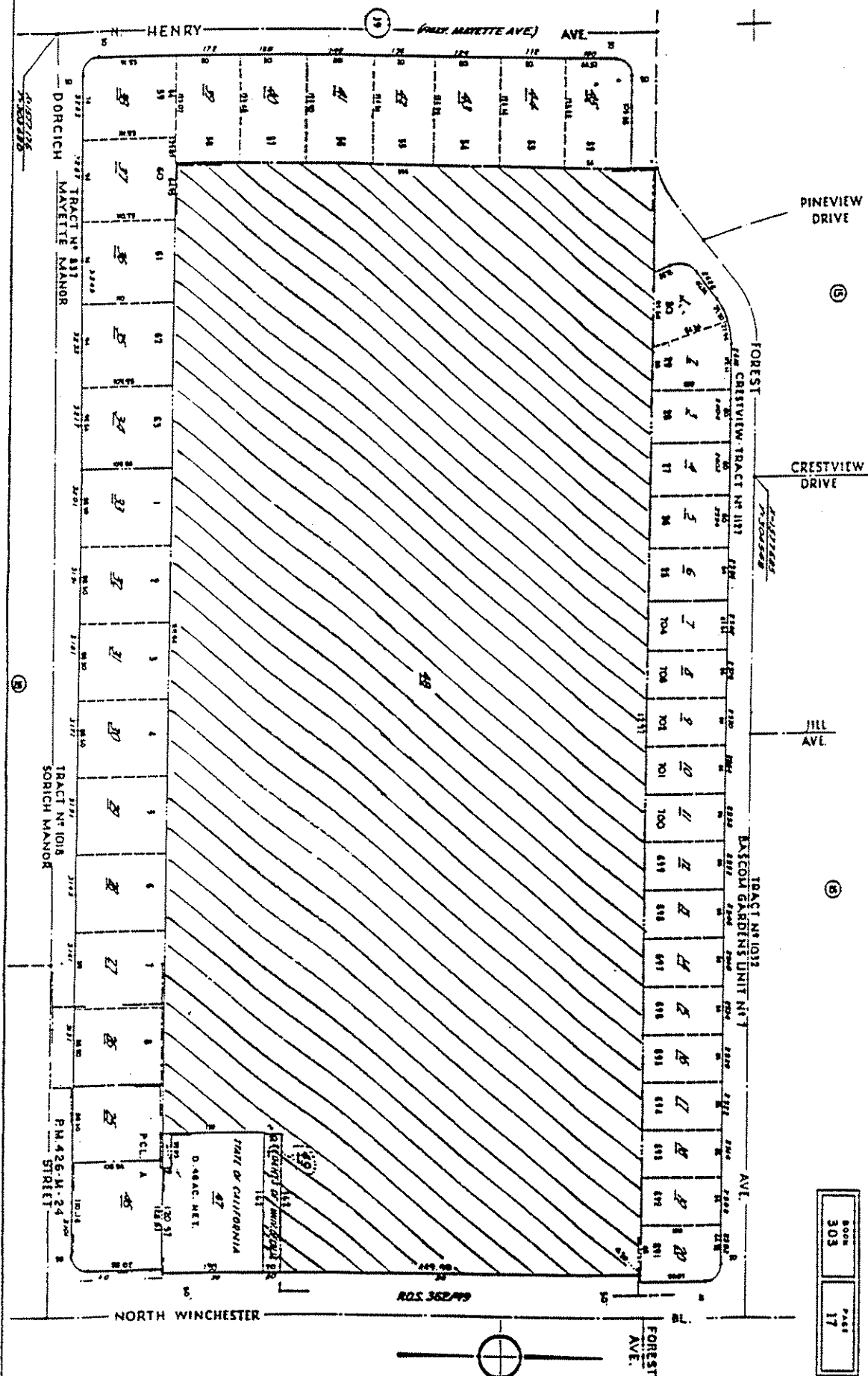
C - SCOPE OF WORK

D - COST ESTIMATE

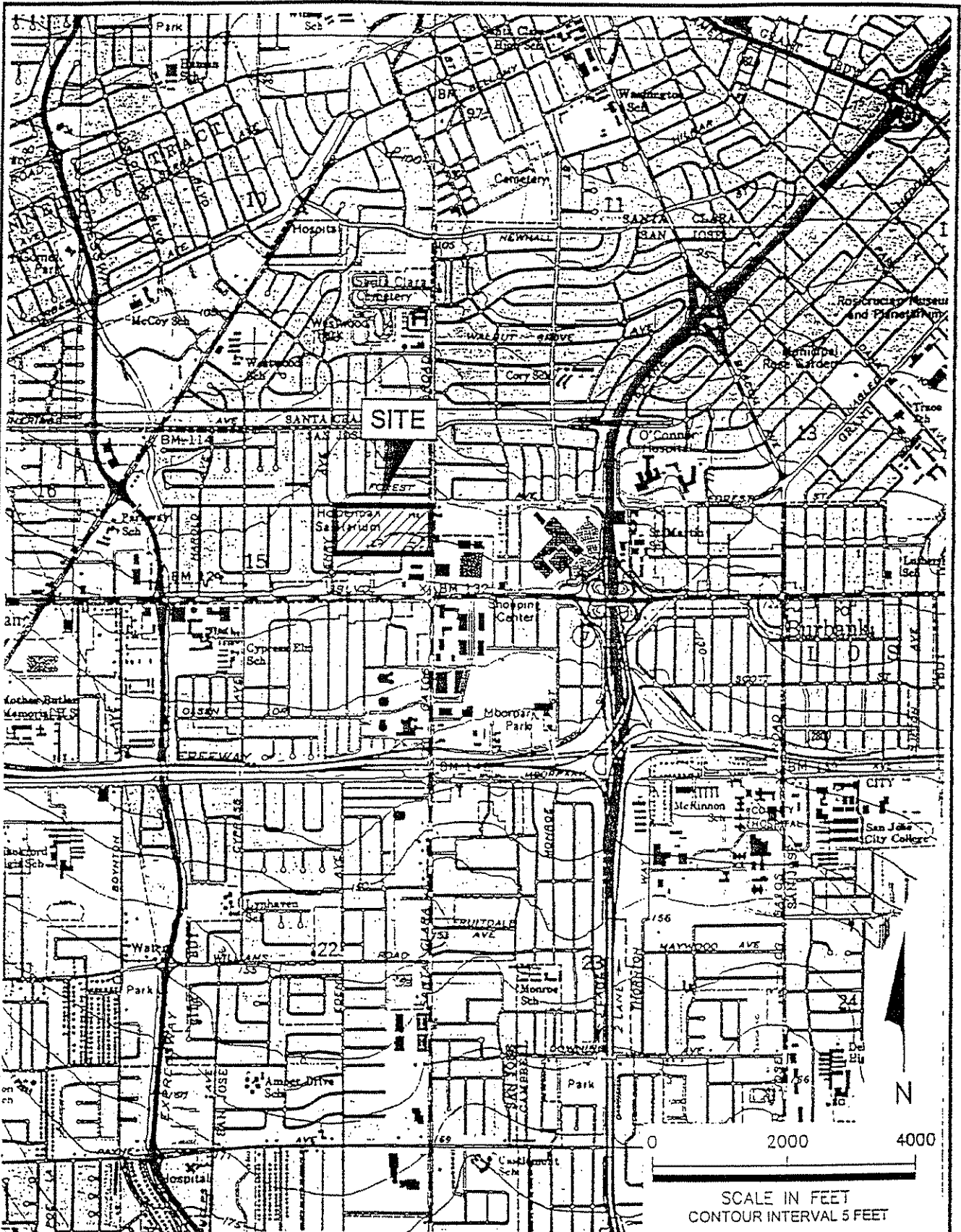
E - SCHEDULE

F - CLOSURE CERTIFICATION

|             |            |
|-------------|------------|
| BOOK<br>303 | PAGE<br>17 |
|-------------|------------|



# EXHIBIT B



## ENVIRON

6001 Shellmound St., Suite 700, Emeryville, CA 94608

### Site Location Map

BAREC

90 N. Winchester Blvd.  
Santa Clara, California

Drafter: RS

Date: 8/19/02

Contract Number: 03-10609A

Approved:

Revised:

## EXHIBIT C

### SCOPE OF WORK

The following Tasks will be completed as part of this Agreement:

#### TASK 1. Submittal of Existing Data

The Proponent will submit to DTSC all background information, sample analysis results, environmental assessment reports, and any other information pertinent to the hazardous substance management and/or release, characterization and cleanup of the Site. DTSC will review the information, identify areas and media of concern, and determine the additional work, if any, required to complete the investigation/remediation of the Site.

TASK 2 Removal Action Workplan. If DTSC determines a removal action is appropriate, the Proponent will prepare a Removal Action Workplan (RAW) in accordance with Health and Safety Code sections 25323.1 and 25356.1. The Removal Action Workplan will include:

- (a) a description of the onsite contamination
- (b) the goals to be achieved by the removal action
- (c) an analysis of the alternative options considered and rejected and the basis for that rejection. This should include a discussion for each alternative which covers its effectiveness, implementability and cost.
- (d) administrative record list

If the proposed removal action does not meet the requirements of Health and Safety Code section 25356.1(h), the Proponent will prepare a Remedial Action Plan (RAP) in accordance with Health and Safety Code section 25356.1(c) for DTSC review and approval.

#### TASK 3. California Environmental Quality Act (CEQA)

The City of Santa Clara is preparing a CEQA environmental review document in connection with Proponent's planned development of the Site. As a responsible agency, DTSC will prepare the necessary CEQA documents. If required, the Proponent shall submit the information necessary for DTSC to prepare these documents.

#### TASK 4. Implementation of Final RAW

Upon DTSC approval, Proponent shall implement the final RAW as approved in accordance with the approved schedule.

#### TASK 5. Changes During Implementation of the Final RAW

During implementation of the final RAW, DTSC may specify such additions, modifications and revisions as deemed necessary to protect human health and safety or the environment or to implement the RAW.

#### TASK 6. Public Participation



6.1 Proponent shall conduct appropriate public participation activities given the nature of the community surrounding the Site and the level of community interest. Proponent shall work cooperatively with DTSC to ensure that the affected and interested public and community are involved in DTSC's decision-making process. Any such public participation activities shall be conducted in accordance with Health and Safety Code sections 25358.7 and 25356.1(e), the DTSC Public Participation Policy and Procedures Manual, and with DTSC's review and approval.

6.2 The Proponent shall prepare a community profile to examine the level of the community's knowledge of the Site; the types of community concerns; the proximity of the Site to homes and/or schools, day care facilities, churches, etc.; the current and proposed use of the Site; media interest; and involvement of community groups and elected officials.

6.3 The Proponent shall develop and submit fact sheets to DTSC for review and approval when specifically requested by DTSC. Proponent shall be responsible for printing and distribution of fact sheets upon DTSC approval using the approved community mailing list.

6.4 The Proponent shall publish, in a major local newspaper(s), a public notice announcing the availability of the RAW for public review and comment. The public comment period shall last a minimum of thirty (30) days.

6.5 DTSC may require that the Proponent hold at least one public meeting to inform the public of the proposed activities and to receive public comments on the RAW.

6.6 Within two (2) weeks of the close of the public comment period, the Proponent shall prepare and submit to DTSC a draft response to the public comments received.

6.7 If appropriate, the Proponent will revise the RAW on the basis of comments received from the public, and submit the revised RAW to DTSC for review and approval. The Proponent will also notify the public of any significant changes from the action proposed in the RAW.

#### TASK 7. Discontinuation of Remedial Technology

Any remedial technology employed in implementation of the final RAW shall be left in place and operated by the Proponent until and except to the extent that DTSC authorizes the Proponent in writing to discontinue, move or modify some or all of the remedial technology because the Proponent has met the criteria specified in the final RAW for its discontinuance, or because the modifications would better achieve the goals of the final RAW.

#### TASK 8. Quality Assurance/Quality Control (QA/QC) Plan

All sampling and analysis conducted by the Proponent under this Agreement shall be performed in accordance with a QA/QC Plan submitted by the Proponent and approved by DTSC. The QA/QC Plan will describe:

- (a) the procedures for the collection, identification, preservation and transport of samples;
- (b) the calibration and maintenance of instruments;
- (c) the processing, verification, storage and reporting of data, including chain of custody procedures and identification of qualified person(s) conducting the sampling and of a laboratory certified or approved by DTSC pursuant to Health and Safety Code section 25198; and
- (d) how the data obtained pursuant to this Agreement will be managed and preserved in accordance with the Preservation of Documentation section of this Agreement.

**TASK 9. Health and Safety Plan**

The Proponent will submit a Site Health and Safety Plan in accordance with California Code of Regulations, Title 8, section 5192 and DTSC guidance, which covers all measures, including contingency plans, which will be taken during field activities to protect the health and safety of the workers at the Site and the general public from exposure to hazardous waste, substances or materials. The Health and Safety Plan should describe the specific personnel, procedures and equipment to be utilized.

**Task 10. Completion/Implementation Report**

Proponent shall submit a report describing the remedial actions taken at the Site and identifying how remedial action objectives have been achieved.

**Task 11. Closure Certification**

Based upon the approved Completion/Implementation Report, DTSC shall prepare documents to certify closure of the Site.

# VOLUNTARY CLEANUP Cost Estimates - Project Manager Worksheet

| Title                            | Project Manager | Legal Senior Staff | Toxicology Staff | HQ-CEQA | Industrial Hygiene | Public Participation | Tech. SR./ Supervisor |
|----------------------------------|-----------------|--------------------|------------------|---------|--------------------|----------------------|-----------------------|
| Classification                   | HSS/HSE         | Counsel            | Toxicologist     | EP      | AIH                | PPS                  | SHSE/SHSS             |
| Task:                            |                 |                    |                  |         |                    |                      |                       |
| Agreement                        |                 |                    |                  |         |                    |                      |                       |
| Preparation/Negotiation          | 0               | 2                  |                  |         |                    |                      | 6                     |
| Review Existing Documents        | 24              |                    |                  |         |                    |                      | 6                     |
| Public Participation             | 16              |                    |                  |         |                    | 40                   | 4                     |
| CEQA                             | 32              |                    |                  | 40      |                    |                      | 8                     |
| RAP/RAW                          | 40              | 6                  | 16               |         | 10                 | 10                   | 20                    |
| Response to Comments             | 20              | 6                  |                  |         |                    | 10                   | 6                     |
| Oversight                        | 20              |                    |                  |         |                    |                      |                       |
| Completion/Implementation Report | 16              |                    |                  |         |                    |                      | 4                     |
| Project Management               | 12              |                    |                  |         |                    |                      | 6                     |
| Certification                    | 8               |                    |                  |         |                    |                      | 2                     |
| Total No. Hours/Class            | 188             | 14                 | 16               | 40      | 10                 | 60                   | 62                    |
| Total No. Hours                  | 390             |                    |                  |         |                    |                      |                       |
| Hourly Rate/Class                | 120             | 150                | 154              | 128     | 129                | 101                  | 132                   |
| Cost/Class                       | 22560           | 2100               | 2464             | 5120    | 1290               | 6060                 | 8184                  |
| Total Costs                      | 47778           |                    |                  |         |                    |                      |                       |

Hourly Rate include direct costs and indirect costs at a rate of 188.43%

**EXHIBIT E**

**TENTATIVE PROJECT SCHEDULE**

DGS - BAREC Project  
Virginia Lasky  
Karen Toth

| ID | Task Name   | Duration | Start        | Finish                       | Professionals | Resource Name  |
|----|---|----------|--------------|------------------------------|---------------|--|
| 1  | Voluntary Cleanup Agreement(VCA)                    | 154 days | Thu 09/12/02 | Tue 04/15/03                 |               |  |
| 2  | DTSC Drafts VCA                                     | 4 days   | Thu 09/12/02 | Tue 09/17/02                 |               |  |
| 3  | DGS reviews VCA                                     | 16 days  | Wed 11/20/02 | Wed 12/11/02                 |               |  |
| 4  | DTSC reviews VCA                                    | 2 days   | Thu 12/12/02 | Fri 12/13/02 3               |               |  |
| 5  | DGS comments on the VCA                             | 3 days   | Mon 03/24/03 | Wed 03/26/03                 |               |  |
| 6  | DTSC reviews VCA                                    | 1 day    | Thu 03/27/03 | Thu 03/27/03 5               |               |  |
| 7  | DGS Signs VCA                                       | 8 days   | Fri 03/28/03 | Tue 04/09/03 6               |               |  |
| 8  | DTSC Signs VCA                                      | 2 days   | Mon 04/14/03 | Tue 04/15/03 71 S+3 days     |               |  |
| 9  | Existing Data                                       | 134 days | Mon 11/18/02 | Thu 05/22/03                 |               |  |
| 10 | RP submits existing data                            | 1 day    | Mon 11/18/02 | Mon 11/18/02                 |               |  |
| 11 | DTSC reviews existing data                          | 15 days  | Thu 11/28/02 | Wed 12/18/02 10              |               |  |
| 12 | RP submits revised Report                           | 1 day    | Wed 04/30/03 | Wed 04/30/03 11              |               |  |
| 13 | DTSC reviews Report                                 | 15 days  | Thu 05/01/03 | Wed 05/21/03 12              |               |  |
| 14 | DTSC approves Report                                | 1 day    | Thu 05/22/03 | Thu 05/22/03 13              |               |  |
| 15 | DRAFT REMOVAL ACTION WORKPLAN (RAW)                 | 113 days | Thu 05/01/03 | Mon 10/06/03                 |               |  |
| 16 | RP Prepares draft RAW                               | 10 days  | Thu 05/01/03 | Wed 05/14/03                 |               | Responsible Party  |
| 17 | DTSC reviews and comments on draft RAW              | 20 days  | Thu 05/15/03 | Wed 06/11/03 16              |               | Project Manager, Attorney, Supervisor, Geologist, Engineering Support              |
| 18 | RP Revises draft RAW                                | 20 days  | Thu 06/12/03 | Wed 07/09/03 17              |               | Responsible Party  |
| 19 | DTSC reviews and approves final draft RAW           | 24 days  | Thu 07/10/03 | Tue 08/12/03 18              |               | Project Manager, Supervisor, Branch Chief  |
| 20 | DTSC approves final RAW                             | 6 days   | Tue 08/23/03 | Tue 09/30/03 48              |               | Responsible Party, Supervisor, Branch Chief, Project Manager                       |
| 21 | RP Distributes final RAW                            | 4 days   | Wed 10/01/03 | Mon 10/06/03 20              |               | Responsible Party, Project Manager   |
| 22 | CEQA  | 289 days | Thu 09/12/02 | Tue 10/21/03                 |               |  |
| 23 | RP prepares Draft EIR                               | 220 days | Thu 09/12/02 | Wed 07/16/03                 |               | Project Manager  |
| 24 | DTSC Prepares responsible agency checklist          | 9 days   | Thu 07/17/03 | Tue 07/29/03 23              |               | Project Manager  |
| 25 | Transmittal checked to PEAS                         | 1 day    | Wed 07/23/03 | Wed 07/30/03 24              |               | Supervisor, Project Manager  |
| 26 | PEAS reviews checklist                              | 15 days  | Thu 07/31/03 | Wed 08/20/03 25              |               | PEAS Reviewer  |
| 27 | Incorporate comments from PEAS                      | 5 days   | Thu 08/21/03 | Wed 08/27/03 26              |               | Project Manager  |
| 28 | Complete Notice of Determination (NOD) package      | 2 days   | Thu 08/28/03 | Fri 08/29/03 27              |               | Project Manager, Supervisor, Branch Chief  |
| 29 | Approve NOD package                                 | 1 day    | Mon 09/01/03 | Mon 09/01/03 28              |               | Project Manager, Branch Chief, Supervisor  |
| 30 | Transmit NOD package to PEAS                        | 1 day    | Tue 09/02/03 | Tue 09/02/03 29              |               | Project Manager, Supervisor  |
| 31 | PEAS processes NOD package and files with OPR       | 5 days   | Wed 09/03/03 | Tue 09/09/03 30              |               | PEAS Reviewer  |
| 32 | 30-day NOD challenge period                         | 30 days  | Wed 09/10/03 | Tue 10/21/03 31              |               |  |
| 33 | PUBLIC PARTICIPATION ACTIVITIES                     | 91 days  | Tue 05/28/03 | Tue 09/23/03                 |               |  |
| 34 | RP Updates mailing list and CRP/PPP                 | 2 days   | Tue 05/20/03 | Wed 05/21/03 11              |               | Public Participation Specialist, Project Manager                                   |
| 35 | RP Prepares draft Fact Sheet                        | 2 days   | Thu 07/03/03 | Fri 07/04/03 34FS+30 days    |               | Project Manager, Public Participation Specialist, Responsible Party                |
| 36 | DTSC reviews draft Fact Sheet                       | 2 days   | Mon 07/07/03 | Tue 07/08/03 17.35           |               | Project Manager, Public Participation Specialist, Supervisor                       |
| 37 | RP Revises draft Fact Sheet                         | 2 days   | Wed 07/09/03 | Thu 07/10/03 36              |               | Responsible Party  |
| 38 | DTSC approves Fact Sheet                            | 1 day    | Fri 07/11/03 | Fri 07/11/03 37              |               | Project Manager, Supervisor, Public Participation Specialist                       |
| 39 | RP Prints Fact Sheet                                | 2 days   | Mon 07/14/03 | Fri 07/19/03 38              |               | Responsible Party  |
| 40 | RP mails Fact Sheet                                 | 2 days   | Mon 07/14/03 | Tue 07/22/03 39              |               | Project Manager, Supervisor, Public Participation Specialist                       |
| 41 | RP Mails Fact Sheet                                 | 2 days   | Wed 08/13/03 | Thu 08/14/03 19.40           |               | Responsible Party  |
| 42 | Public Notice                                       | 26 days  | Wed 07/09/03 | Wed 08/13/03                 |               | Newspaper, AD, Responsible Party, Project Manager, Public Participation Specialist |
| 43 | RP Prepares draft Public Notice                     | 1 day    | Wed 07/09/03 | Wed 07/09/03 17.36           |               | Responsible Party  |
| 44 | DTSC reviews draft Public Notice                    | 5 days   | Thu 07/10/03 | Wed 07/16/03 43              |               | Public Participation Specialist, Project Manager, Supervisor                       |
| 45 | RP Publishes Public Notice                          | 1 day    | Wed 08/13/03 | Wed 08/13/03 44FS+2 days, 19 |               | Responsible Party  |
| 46 | RP Updates information repositories                 | 1 day    | Thu 08/14/03 | Thu 08/14/03 38.45           |               | Responsible Party  |
| 47 | Public Comment Period                               | 23 days  | Thu 08/14/03 | Mon 09/15/03 45              |               |  |
| 48 | DTSC Prepares Responsiveness Summary                | 1 wk     | Tue 09/16/03 | Mon 09/22/03 47              |               | Project Manager, Supervisor  |
| 49 | DTSC Transmits Responsiveness Summary to commentors | 1 day    | Tue 09/23/03 | Tue 09/23/03 48              |               | Project Manager, Supervisor  |
| 50 | Implementation                                      | 39 days  | Wed 10/22/03 | Mon 12/15/03                 |               |  |
| 51 | RP Implements RAW                                   | 15 days  | Wed 10/22/03 | Tue 11/11/03 20FS+15 days    |               | Project Manager, Geologist   |

DGS - BAREC Project  
Virginia Lasky  
Karen Toth

| Task Name | Duration | Start        | Finish       | Predecessors   | Resource Name |
|-----------|----------|--------------|--------------|----------------|---------------|
| 10        |          |              |              |                |               |
| 1         | 154 days | Thu 09/12/02 | Tue 04/15/03 |                |               |
| 2         | 4 days   | Thu 09/12/02 | Tue 09/17/02 |                |               |
| 3         | 16 days  | Wed 11/20/02 | Wed 12/11/02 |                |               |
| 4         | 2 days   | Thu 12/12/02 | Fri 12/13/02 | 3              |               |
| 5         | 3 days   | Mon 03/24/03 | Wed 03/26/03 |                |               |
| 6         | 1 day    | Thu 03/27/03 | Thu 03/27/03 | 5              |               |
| 7         | 8 days   | Fri 03/28/03 | Tue 04/08/03 | 6              |               |
| 8         | 2 days   | Mon 04/14/03 | Tue 04/15/03 | 7FS+3 days     |               |
| 9         | 134 days | Mon 11/18/02 | Thu 05/22/03 |                |               |
| 10        | 1 day    | Mon 11/18/02 | Mon 11/18/02 |                |               |
| 11        | 15 days  | Thu 11/28/02 | Wed 12/18/02 | 10             |               |
| 12        | 1 day    | Wed 04/30/03 | Wed 04/30/03 | 11             |               |
| 13        | 15 days  | Thu 05/01/03 | Wed 05/21/03 | 12             |               |
| 14        | 1 day    | Thu 05/22/03 | Thu 05/22/03 | 13             |               |
| 15        | 113 days | Thu 05/01/03 | Mon 10/06/03 |                |               |
| 16        | 10 days  | Thu 05/01/03 | Wed 05/14/03 |                |               |
| 17        | 20 days  | Thu 05/15/03 | Wed 06/11/03 | 16             |               |
| 18        | 20 days  | Thu 06/12/03 | Wed 07/09/03 | 17             |               |
| 19        | 24 days  | Thu 07/10/03 | Tue 08/12/03 | 18             |               |
| 20        | 6 days   | Tue 08/20/03 | Tue 09/30/03 | 48             |               |
| 21        | 4 days   | Wed 10/01/03 | Mon 10/06/03 | 20             |               |
| 22        | 269 days | Thu 09/12/02 | Tue 10/12/03 |                |               |
| 23        | 220 days | Thu 09/12/02 | Wed 07/16/03 |                |               |
| 24        | 9 days   | Thu 07/17/03 | Tue 07/29/03 | 23             |               |
| 25        | 1 day    | Wed 07/30/03 | Wed 07/30/03 | 24             |               |
| 26        | 15 days  | Thu 07/31/03 | Wed 08/20/03 | 25             |               |
| 27        | 5 days   | Thu 08/21/03 | Wed 08/27/03 | 26             |               |
| 28        | 2 days   | Thu 08/28/03 | Fri 08/29/03 | 27             |               |
| 29        | 1 day    | Mon 09/01/03 | Mon 09/01/03 | 28             |               |
| 30        | 1 day    | Tue 09/02/03 | Tue 09/02/03 | 29             |               |
| 31        | 5 days   | Wed 09/03/03 | Tue 09/09/03 | 30             |               |
| 32        | 30 days  | Wed 09/10/03 | Tue 10/21/03 | 31             |               |
| 33        | 91 days  | Tue 05/20/03 | Tue 09/23/03 |                |               |
| 34        | 2 days   | Tue 05/20/03 | Wed 05/21/03 | 11             |               |
| 35        | 2 days   | Thu 07/03/03 | Fri 07/04/03 | 34FS+30 days   |               |
| 36        | 2 days   | Mon 07/07/03 | Tue 07/08/03 | 17,35          |               |
| 37        | 2 days   | Wed 07/09/03 | Thu 07/10/03 | 36             |               |
| 38        | 1 day    | Fri 07/11/03 | Fri 07/11/03 | 37             |               |
| 39        | 5 days   | Mon 07/14/03 | Fri 07/18/03 | 38             |               |
| 40        | 2 days   | Mon 07/21/03 | Tue 07/22/03 | 39             |               |
| 41        | 2 days   | Wed 08/13/03 | Thu 08/14/03 | 19,40          |               |
| 42        | 26 days  | Wed 07/09/03 | Wed 08/13/03 |                |               |
| 43        | 1 day    | Wed 07/09/03 | Wed 07/09/03 | 17,36          |               |
| 44        | 5 days   | Thu 07/10/03 | Wed 07/16/03 | 43             |               |
| 45        | 1 day    | Wed 08/13/03 | Wed 08/13/03 | 44FS+2 days,19 |               |
| 46        | 1 day    | Thu 08/14/03 | Thu 08/14/03 | 38,45          |               |
| 47        | 23 days  | Thu 08/14/03 | Mon 09/15/03 | 45             |               |
| 48        | 1 wk     | Tue 09/16/03 | Mon 09/22/03 | 47             |               |
| 49        | 1 day    | Tue 09/23/03 | Tue 09/23/03 | 48             |               |
| 50        | 38 days  | Wed 10/22/03 | Mon 12/15/03 |                |               |
| 51        | 15 days  | Wed 10/22/03 | Tue 11/11/03 | 20FS+15 days   |               |

## EXHIBIT F

February 20, 2002

Mr. Scott Hilk  
Project Manager Land Development  
Centex Homes  
1855 Gateway Boulevard, Suite 650  
Concord, CA 94520-8417

Dear Mr. Hilk:

The Department of Toxic Substances Control (DTSC) has received the Completion/Implementation Report for Phase III of the Rivermark Development Project (Phase III Completion/Implementation Report) dated January 16, 2002. This report covers the third phase of a redevelopment project at the former Agnews Development Center – West Campus in Santa Clara, California. DTSC provided guidance and oversight for the development and implementation of a risk assessment and Remedial Action Plan (RAP) for this site along with the following additional documents: a Remedial Investigation report, Community Relations Plan, a QA/QC Plan, a Health & Safety Plan, a Soil Remedial Design and Implementation Plan and the Phase III Completion/Implementation Report.

*This site was formerly used for agricultural purposes. Sampling and analysis were conducted for each chemical of concern (metals, pesticides and VOCs). Remedial goals were established in a risk assessment which used health based criteria for unrestricted residential land use and evaluated potential threats from these chemicals to public health and the environment. These conservative risk-based remedial goals were included in the RAP which was approved on November 20, 2000. The RAP required that any soil above the remedial goals would be excavated and properly managed off-site. On December 19, 2000, DTSC approved the Soil Remedial Design and Implementation Plan and supporting documents for this project.*

Our review of the Completion/Implementation Report for the Phase III area indicates that the work has been conducted in accordance with the approved RAP and the Soil Remedial Design and Implementation Plan and that the remedial goals for Phase III area have been achieved. DTSC hereby approves the Draft Completion/Implementation Report (dated January 16, 2002) for the Phase III area as a final report. With completion of this remediation, the Phase III area does not pose a threat to human health or the environment under any land use, including unrestricted residential development and is safe for occupancy for single family homes. Therefore, DTSC determines that no further action is necessary with respect to investigation and

Scott Hilk  
February 20, 2002  
Page 2

remediation of hazardous substances at the site. As with any real property, if previously unidentified contamination is discovered at the Site, additional assessment investigation and/or clean up may be required.

If you have any questions regarding this approval, please contact Virginia Lasky of my staff at (510) 540-3829.

Sincerely,

Barbara J. Cook, P.E., Chief  
Northern California  
Coastal Cleanup Operations Branch

cc: Mr. Thomas F. McCloskey  
Principal Environmental Geologist  
Lowney Associates  
405 Clyde Avenue  
Mountain View, CA 94043-2209

Mr. Larry Buczyk  
Department of General Services  
Real Estate Service Division,  
Asset Planning and Enhancement Div.  
707 3<sup>rd</sup> Street, Suite 6-130  
West Sacramento, CA 95605



Tables 3, 3a, 3b, and 3c of the Phase II Site Characterization Report

**Table 3**  
**Chemicals of Potential Concern (COPCs) in Soil**

| Chemical Name   | Years of Use at Site              |
|---|-----------------------------------|
| <b><i>Organochlorine Pesticides - EPA Method 8081</i></b>   |                                   |
| Aldrin  | No Record of Use                  |
| Dieldrin  | No Record of Use                  |
| Endrin aldehyde   | No Record of Use                  |
| Endrin  | No Record of Use                  |
| Endrin ketone   | No Record of Use                  |
| Heptachlor  | No Record of Use                  |
| Heptachlor epoxide  | No Record of Use                  |
| 4,4'-DDD  | No Record of Use                  |
| 4,4'-DDE  | No Record of Use                  |
| 4,4'-DDT  | No Record of Use                  |
| Endosulfan I  | No Record of Use                  |
| Endosulfan II   | No Record of Use                  |
| HCH (alpha) or alpha-BHC                                    | No Record of Use                  |
| HCH (beta) or beta-BHC                                      | No Record of Use                  |
| delta-BHC   | No Record of Use                  |
| HCH (gamma), Lindane, or gamma-BHC                          | No Record of Use                  |
| Endosulfan sulfate  | No Record of Use                  |
| 4,4'-Methoxychlor   | No Record of Use                  |
| Toxaphene   | No Record of Use                  |
| Chlordane (Technical)                                       | No Record of Use                  |
| alpha-Chlordane   | No Record of Use                  |
| gamma-Chlordane   | No Record of Use                  |
| <b><i>Organophosphorus Pesticides - EPA Method 8140</i></b> |                                   |
| Acephate (Orthene) (By EPA 1657)                            | 1980, 1984, 1989-1991, 1994       |
| Atrazine  | 1986, 1988, 1990-2002             |
| Azinphos methyl   | No Record of Use                  |
| Carbophenothion   | No Record of Use                  |
| Chlorpyrifos  | 1998                              |
| Diazinon  | 1984, 1985, 1987, 1990-1993, 1995 |
| Dimethoate  | No Record of Use                  |
| Disulfoton (Disyston)                                       | No Record of Use                  |
| Ethion  | No Record of Use                  |
| Fenthion  | No Record of Use                  |
| Malathion   | 1988, 1990, 1991, 1993-1995       |
| Mevinphos   | No Record of Use                  |
| Ethyl parathion   | No Record of Use                  |
| Methyl parathion  | No Record of Use                  |
| Phorate   | No Record of Use                  |
| Prometon  | No Record of Use                  |
| Prometryn   | No Record of Use                  |
| Propazine   | No Record of Use                  |
| Simazine  | No Record of Use                  |

**Table 3**  
**Chemicals of Potential Concern (COPCs) in Soil**

| Chemical Name  | Years of Use at Site        |
|--|-----------------------------|
| <i><b>Carbamate and Urea Pesticides - EPA Method 632</b></i> |                             |
| Bromacil   | No Record of Use            |
| Carbofuran (Furadan)   | No Record of Use            |
| Carbaryl (Sevin)   | 2002                        |
| Chlorpropham   | No Record of Use            |
| Diuron   | No Record of Use            |
| Fluometuron  | No Record of Use            |
| Linuron  | 1998                        |
| Methiocarb   | No Record of Use            |
| Methomyl   | No Record of Use            |
| Monuron  | No Record of Use            |
| Neburon  | No Record of Use            |
| Oxamyl   | No Record of Use            |
| Propham  | No Record of Use            |
| Propoxur   | No Record of Use            |
| <i><b>Triazine Herbicides - EPA Method 8141</b></i>          |                             |
| Atraton  | No Record of Use            |
| Simazine   | No Record of Use            |
| Prometon   | No Record of Use            |
| Atrazine   | No Record of Use            |
| Propazine  | No Record of Use            |
| Simetryn   | No Record of Use            |
| Ametryn  | No Record of Use            |
| Prometryn  | No Record of Use            |
| Terbutryn  | No Record of Use            |
| <i><b>Chlorinated Herbicides - EPA Method 8151</b></i>       |                             |
| 2,4-Dichlorophenoxyacetic Acid (2,4-D)                       | 1990, 1991, 1993-1999       |
| 2,4,5-Trichlorophenoxyacetic Acid (2,4,5-T)                  | No Record of Use            |
| 2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)           | No Record of Use            |
| 2-Methyl-4-chlorophenoxyacetic acid (MCPA)                   | No Record of Use            |
| 2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)           | 1990, 1991, 1993-2000, 2002 |
| Paraquat   | 1979-1981, 1999, 2000       |
| Diquat   | 1984-1997                   |

**Table 3**  
**Chemicals of Potential Concern (COPCs) in Soil**

| Chemical Name                                  | Years of Use at Site  |
|--|-----------------------|
| <i>Inorganics/Metals - Various EPA Methods</i> |                       |
| Arsenic  | 1979-1981, 1983-1985  |
| Antimony                                       | No Record of Use      |
| Barium   | No Record of Use      |
| Beryllium                                      | No Record of Use      |
| Cadmium  | No Record of Use      |
| Total Chromium                                 | No Record of Use      |
| Cobalt   | No Record of Use      |
| Copper   | 1980, 1984-1987, 1998 |
| Cyanide  | No Record of Use      |
| Lead   | No Record of Use      |
| Mercury  | No Record of Use      |
| Molybdenum                                     | No Record of Use      |
| Nickel   | No Record of Use      |
| Selenium                                       | No Record of Use      |
| Silver   | No Record of Use      |
| Thallium                                       | No Record of Use      |
| Vanadium                                       | No Record of Use      |
| Zinc   | No Record of Use      |

**Table 3a**  
**Half-Lives and Mass Removed of Chemicals Used at the BAREC**

| CAS Number | Chemical Name   | Brand Name        | Half-Life (days) | Last year used | Mass Removed |
|------------|---|-------------------|------------------|----------------|--------------|
| 2227170    | Perchloro-1,1'-bicyclopenta-2,4-dienyl  | Pentho-WP         | 84               | 1989           | 100.00%      |
| 13121705   | Cyhexatin   | Plictran          | 50               | 1984           | 100.00%      |
| 19044883   | Oryzalin  | Surflan           | 128              | 1997           | 100.00%      |
| 15299997   | Napropamide   | Devrinol          | 84               | 1999           | 100.00%      |
| 39300453   | Dinitro (1-methyl heptyl)**phenyl crotonate   | Doo Spray         | 6                | 1987           | 100.00%      |
| 1861321    | Dimethyl 2,3,5,6-tetrachloro-1,4-benzenedicarboxylate; Chlorthal-dimethyl; DCPA; TCPT; Dimethyl tetrachloroterephthalate) | Dacthal W-75      | 100              | 1997           | 100.00%      |
| 23950585   | Promanide   | Kerb 50WP         | 60               | 1988           | 100.00%      |
| 102851069  | Tau-Fluvalinate   | Mavrik            | 8                | 1990           | 100.00%      |
| 2312358    | Propargite  | Omite 30W         | 64               | 1996           | 100.00%      |
| 35367385   | Diifluron   | Dimilin 25W       | 4                | 1990           | 100.00%      |
| 86500      | O,O-Dimethyl S-(4-oxo-1,2,3-benzotriazin-3(4H)-yl)methylphosphorodithioate  | Guthion           | 355              | 1990           | 99.99%       |
| 36734197   | Iprodione   | 26019 Fungicide   | 60               | 1992           | 100.00%      |
| 1897456    | Chloroathalonil   | Daconil 2787 75WP | 90               | 1992           | 100.00%      |
| 40487421   | Pendimethalin   | Pre M 60 WDG      | 40               | 2001           | 100.00%      |
| 1861401    | Benefin   | Team 2g           | 51               | 1993           | 100.00%      |
| 533744     | Dazomet   | Basamid           | 7                | 1993           | 100.00%      |
| Not found  | Sodium methylthiocarbamate (anhydrous)  | Vapam             | 7                | 1999           | 100.00%      |
| 71751412   | Abamectin   | Avid              | 1                | 2000           | 100.00%      |
| 88671890   | Myclobutanil  | Eagle             | 71               | 1996           | 100.00%      |
| 1702176    | Clopylarid  | Stinger           | 26               | 1999           | 100.00%      |
| 25057890   | Sodium Bentazon   | Basagran T/O      | 98               | 1997           | 100.00%      |
| 1689845    | Bromoxynil  | Buctril           | 14               | 2001           | 100.00%      |
| 77182822   | Glufosinate - Ammonium  | Liberty           | 10               | 1998           | 100.00%      |
| 52315078   | Cypermethrin  | Barricade         | 56               | 1998           | 100.00%      |
| 79241466   | Fluazifop - P - Butyl   | Fusilade II       | 7                | 2002           | 100.00%      |
| 74839      | Methyl Bromide  | Methyl Bromide    | 60               | 1999           | 100.00%      |
| 542756     | 1,3 - Dichloropropene   | Telone C35 EC     | 69               | 1999           | 100.00%      |
| 76062      | Chloropicrin  | Telone C35 EC     | 1                | 1999           | 100.00%      |

Table 3b

## Estimated Concentration of Chemicals Used at the BAREC

| CAS Number | Chemical Name            | Brand Name    | Chemical Mass (kg) | Area (feet <sup>2</sup> ) | Soil Mass (kg) | Concentration (mg/kg) | PRG (mg/kg) | Half Life (days) |
|------------|--------------------------|---------------|--------------------|---------------------------|----------------|-----------------------|-------------|------------------|
| 1071836    | Glyphosate               | Round Up      | 50,523             | 6,612,408                 | 5.E+09         | 9.54                  | 6.1E+03     | 47               |
| 19666309   | Oxadiazon                | Ronstar 50WP  | 233                | 255,843                   | 2.E+08         | 1.14                  | 3.1E+02     | 180              |
| 17804352   | Benomyl                  | Benlate       | 0.07               | 4,320                     | 3.E+06         | 0.02                  | 3.1E+03     | 365              |
| 1582098    | Trifluralin              | Team 2g       | 0.2                | 600                       | 5.E+05         | 0.41                  | 6.3E+01     | 240              |
| 82558507   | Isoxaben                 | Snapshot 2.5g | 0.2                | 5,696                     | 5.E+06         | 0.04                  | 3.1E+03     | 180              |
| 51218452   | Metolachlor              | Pennant (L)   | 11.4               | 302,574                   | 2.E+08         | 0.05                  | 9.2E+03     | 70               |
| 42874033   | Oxyfluorfen              | Rout          | 10.05              | 454,905                   | 4.E+08         | 0.03                  | 1.8E+02     | 40               |
| 95636      | 1,2,4 - Trimethylbenzene | Buctril       | 1.6                | 71,653                    | 6.E+07         | 0.03                  | 5.2E+01     | NA               |
| 1330207    | Xylene                   | Buctril       | 1.6                | 71,453                    | 6.E+07         | 0.03                  | 2.1E+02     | NA               |
| 100414     | Ethylbenzene             | Buctril       | 1.6                | 71,453                    | 6.E+07         | 0.03                  | 2.3E+02     | NA               |
| 78587050   | Hexythiazox              | Hexythiazox   | 0.0003             | 218                       | 2.E+05         | 0.002                 | 1.5E+03     | NA               |

PRGs – USEPA Region IX Preliminary Remediation Goals for residential soil, November 2000.

NA – Half Life Not available

| Table 3c<br>Estimated Concentrations and Rationale for Not Analyzing Certain Chemicals |   |                   |                  |                    |                           |                                 |   |
|--|---|-------------------|------------------|--------------------|---------------------------|---------------------------------|---|
| CAS Number   | Chemical Name   | Brand Name        | Last Year of Use | Chemical Mass (kg) | Area (feet <sup>2</sup> ) | Estimated Concentration (mg/kg) | Rationale for Not Analyzing   |
| 13356086   | Fenbutatin-Oxide [Hexakis (2-Methyl-2-Phenylpropyl) distannoxane] | Vendex 50WP       | 1990             | 0.542              | 6,795                     | 9.97E-02                        | Deminimus concentration   |
| 3478942  | Piperalin: 3-(2-methylpiperidino)propyl-3,4-dichlorobenzoate      | Pipron            | 1980             | 2.410              | 500 plants                | NA                              | Chemical applied directly to plant. Chemical is unlikely to be present at significant concentrations in soil. |
| 7704349  | Sulphur   | Flowable Sulphur  | 1999             | 15.672             | 174,240                   | 1.12E-01                        | Sulphur is present in the ambient environment and is of low toxicity  |
| 26644462   | Triforine   | Triforine         | 1994             | 0.415              | 500 plants                | NA                              | Chemical applied directly to plant. Chemical is unlikely to be present at significant concentrations in soil. |
| Not found  | Petroleum Oil   | Heavy Dormant Oil | 1986             | 4.883              | 103,455                   | 5.89E-02                        | Low toxicity and deminimus concentration.   |
| 8061527  | Calcium Lignosulfonate  | Kerb 50WP         | 1988             | 0.118              | 653,400                   | 2.26E-04                        | Low toxicity and deminimus concentration.   |
| 55335063   | Triclopyr   | Turflon Ester     | 1999             | 0.937              | 33,980                    | 1.15E-03 <sup>a</sup>           | Low toxicity and deminimus concentration  |
| 8008206  | Kerosene  | Turflon Ester     | 1999             | 0.920              | 33,180                    | 3.46E-02                        | Low toxicity and deminimus concentration  |
| Not found  | Alkylarylpolyoxyethylene ether                                    | Spreader X77      | 1999             | 26.355             | 504,860                   | 6.52E-02                        | Low toxicity/surfactant aids spraying   |

| Table 3c<br>Estimated Concentrations and Rationale for Not Analyzing Certain Chemicals |  |                    |                  |                    |                           |                                 |  |
|--|--|--------------------|------------------|--------------------|---------------------------|---------------------------------|--|
| CAS Number   | Chemical Name  | Brand Name         | Last Year of Use | Chemical Mass (kg) | Area (feet <sup>2</sup> ) | Estimated Concentration (mg/kg) | Rationale for Not Analyzing              |
| Not found  | Sethoxydim: 2-[1-(ethoxymino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one*            | Poast              | 1991             | 0.551              | 43,560                    | 1.58E-02                        | Deminimus concentration                  |
| Not found  | Petroleum Hydrocarbons (Light Paraffinic Distillate, odorless aliphatic petroleum solvent)           | Herbimax           | 1994             | 0.880              | 43,960                    | 2.50E-02                        | Low toxicity and deminimus concentration |
| Not found  | cimectacarb 4-(cyclopropyl-alpha-hydroxy-methylene)-3,5-dioxo-cyclohexanecarboxylic acid ethyl ester | Primo/Experimantal | 1992             | 0.113              | 10,019                    | 1.41E-02                        | Deminimus concentration                  |
| 1332587  | Kaolin   | Daconil 2787 75WP  | 1997             | 0.062              | 2700                      | 2.85E-02                        | Low toxicity and deminimus concentration |
| 97886458   | Dithiopyr  | Dimension 1E       | 1999             | 0.239              | 3610                      | 8.26E-02                        | Deminimus concentration                  |
| 29091212   | Prodiamine   | Prodiamine 65 WDG  | 2000             | 0.007              | 150                       | 5.76E-02                        | Deminimus concentration                  |
| 741582   | Bensulide  | Betasan 4E         | 1999             | 0.162              | 1350                      | 7.72E-04 <sup>b</sup>           | Deminimus concentration                  |



| Table 3c<br>Estimated Concentrations and Rationale for Not Analyzing Certain Chemicals |  |                |                  |                    |                           |                                 |  |
|--|--|----------------|------------------|--------------------|---------------------------|---------------------------------|--|
| CAS Number   | Chemical Name  | Brand Name     | Last Year of Use | Chemical Mass (kg) | Area (feet <sup>2</sup> ) | Estimated Concentration (mg/kg) | Rationale for Not Analyzing              |
| 71283802   | Fenoxaprop-p-ethyl   | Acclaim 1E     | 1993             | 0.008              | 200                       | 4.99E-02                        | Deminimus concentration                  |
| 2163806  | Monosodium acid methanearsonate  | Bueno 6        | 1997             | 0.155              | 1300                      | 8.09E-02 <sup>c</sup>           | Deminimus concentration                  |
| 872504   | N-methylpirrolidone  | Avid           | 2002             | 7.519              | 275,144                   | 3.41E-02                        | Deminimus concentration                  |
| Not found  | Potassium salts of fatty acids   | Safer Soap     | 2000             | 0.990              | 4002                      | 3.09E-01                        | Low toxicity                             |
| 52508357   | Dikegulac-sodium (Sodium salt of 2,3:4,6-bis-O-(1-methylethylidene)-α-L-xylo-2-hexulofuranosonic acid) | Atrimmec PGR   | 1999             | 8.862              | 32,400                    | 6.32E-02 <sup>d</sup>           | Deminimus concentration                  |
| 57213691   | Triclopyr as triethylamine salt  | Confront       | 1999             | 0.048              | 1100                      | 1.81E-03 <sup>a</sup>           | Deminimus concentration                  |
| 1000784201   | Halosulfuron-methyl  | Manage         | 1997             | 0.001              | 500                       | 2.50E-03                        | Deminimus concentration                  |
| 112926008  | Silica, amorphous precipitated   | Manage         | 1999             | 0.004              | 2150                      | 2.27E-03                        | Low toxicity and deminimus concentration |
| 117708602  | Thiazopyr  | Thiazopyr      | 1999             | 0.037              | 764                       | 6.05E-02                        | Deminimus concentration                  |
| Not found  | Maize Gluten Meal  | A-Maizing Lawn | 1998             | 5.443              | 400                       | 1.70E+01                        | Low toxicity and deminimus concentration |
| 64742945   | Solvent Naphta, petroleum, heavy aromatic  | Visor 2E       | 1998             | 0.016              | 264                       | 7.55E-02                        | Low toxicity and deminimus concentration |
| 87674688   | Dimethanamid   | Frontier 6     | 1999             | 0.045              | 1196                      | 4.66E-02                        | Deminimus concentration                  |